DOINGWHATWORKS

Video
FULL DETAILS AND TRANSCRIPT

An Administrator's Perspective on Mathematics Instruction

Madison Elementary, Washington • May 2008

Topic: National Math Panel: Critical Foundations for Algebra
Practice: Comprehensive Instruction

Highlights

- How to determine whether student has automatic recall of basic facts
- Focus on helping students develop strategies
- Problem of focusing only on procedures, without conceptual understanding
- Role of number sense in transitioning to algebra, and recognizing flexible understanding of number sense
- Example that shows whether or not students are developing algebraic thinking

About the Site

Madison Elementary School

Spokane, WA

Demographics

76% White

6% Hispanic

5% Black

3% Asian

2% Native American
24% Free or Reduced-Price Lunch
3% English Language Learners
18% Special Education

Madison has put many practices and strategies in place to "leave nothing to chance" when it comes to teaching mathematics. The staff has deliberately reviewed all aspects of instruction and have well-developed approaches in the following areas:

- Philosophy of building conceptual understanding, problem-solving, and fluency with facts;
- Using an open number line to teach fractions;
- Teachers' strategies for encouraging effort including messages to parents about the importance of effort and persistence;
- Assessment grids used to track performance on benchmark assessments, to analyze individual needs and whole class needs for re-teaching; and,
- Structured protocol for reviewing student work.

Full Transcript

My name is Brent Perdue. I am the principal at Madison Elementary School, Spokane, Washington, Spokane Public Schools.

Let me first start with thinking about basic facts: That's something that comes up often. It was also something we took a very deep study of here at Madison because one of the things we knew is that our kids who struggle with facts—they didn't have the facility to go into the deeper problems because they were not sure how to come up with just some of the basic facts, that you and I might know. Now, what we have done is, we have decided as a staff to adopt…both John Van de Walle and Cathy Fosnot have been to our building, and in the workings, we sort of adopted their belief, which makes sense—that a student has automatic recall if they can come up with a fact or strategy that leads to an answer within three seconds that does not result in them counting or skip-counting, "8, 16, 24." If the know that...If they can't remember 8 x 6, but they know 8 x 5 is 40 and 1 more—that's a strategy. And if they can do it within three seconds, we consider that mastery in basic fact fluency. So, we work on that with all of our kids, that our focus with them is that they have a strategy. When we talk about practicing, knowing these, the kids actually make up strategies; we even sometimes have flash cards, but on the back is the answer—but the back is the strategy, because once the student has the strategy, then after time the strategy becomes automatic.

Conceptual and procedural knowledge are important to develop with students because they can't exist without each other. The student that has procedural background, and they understand procedures, can sometimes follow those—they can line the numbers up, they can follow those pieces, and given, "We

are going to do 1 through 30, odd," they can do all of the problems. But the problem, if they don't have conceptual understanding, is sometimes their misconceptions can lead them astray. If they have only been taught procedures, then the fact that their answer does not make sense to them, or does not fit the problem, doesn't register with students. If they have the conceptual understanding, then they can get a sense if they have made a miss-step. So the issue is, they kind of go hand in hand—what we find, for our struggling learners and our kids that need that additional piece, is not a slowing down or a holding back of the curriculum, but trying to find other times during the day to pull them into smaller groups—to pull them one-on-one, to give them the time they need because we do believe they can reach those standards and mastery.

Students who have flexibility in thinking around number sense can then easily transition to algebra, decompose numbers, put them back together. Couple of years ago, I went with my kindergarten, first, and second grade teachers, as well as my instructional coach, to a three-day seminar on algebraic sense. And before going, they had us have our kids complete a problem—they didn't want any teaching to it, no talking about it, just here's a problem: "Kids, tell me what you can do." And the problem was something like 4+2=blank+5. And so we… You and I look at that, and think, "Oh, well, the answer in the box needs to be a 1," but our students basically said, "4+2=6+5," and the epiphany for us was that our kids were reading left to right—like a book—but they weren't looking at the equal sign as something that had to be balanced on both sides—which is essentially what algebra is. So, that really breaks down into algebra being about having facility and flexibility of thinking in breaking apart number; but at the same time, our kids are having experiences doing lots of different things, so they can pull that apart in their head. It's that flexibility of thinking lots of different strategies that helps them get after those numbers that then leads to algebra. Students really ready for algebra know 48 and 48 is 96—without thinking about it, or having a strategy if they don't know it offhand to be able to say, "Well, 50 and 50 is 100 back 4 is 96"—that's true number sense. And those kinds of kids, when we look at algebra, are able to do amazing things; because it's all about them being flexible in their thinking, and in applying strategies that will help them solve for unknowns. So what we really have tried to do with the time-bound curriculum is—to borrow a phrase—"to leave nothing to chance."